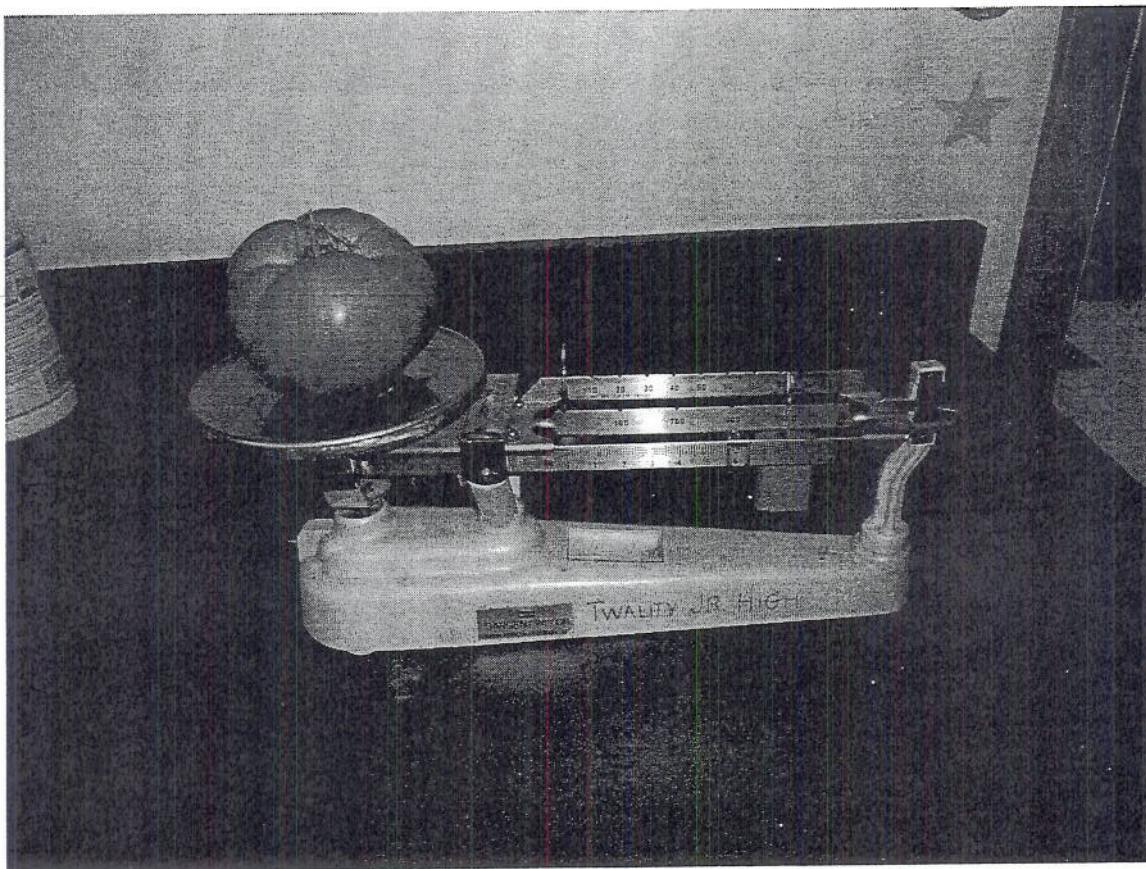


- 8.1.P.1 Describe the atomic model and explain how the types and arrangements of atoms determine physical & chemical properties of elements & compounds.
- 8.1.P.2 Explain how the periodic table is an organization of elements based on their physical & chemical properties.
- 8.2P.1 Compare & contrast physical & chemical changes and how the law of conservation of mass applies to these changes.
- 8.2P.2 Energy how energy is transferred, transformed, conserved. V 1.0 2012

ATOMS & CHEMICAL REACTIONS.



NAME _____

PERIOD _____ **DUE** _____

Counting Atoms

The formula for a compound indicates the elements that make up the compound and the number of atoms of each element present in the compound. These numbers of atoms are indicated by the use of small numbers called subscripts. Sometimes groups of atoms act as a single atom. Such a group of atoms is called a *polyatomic ion*. If a polyatomic ion is used in a formula more than once, it is put in parentheses and the subscript appears outside the parentheses. When a subscript appears outside the parentheses, it indicates that *all* the elements inside the parentheses should be multiplied by that subscript. For example, the formula $\text{Fe}(\text{OH})_3$ indicates the combination of one atom of iron, Fe, three atoms of oxygen, O, and three atoms of hydrogen, H.

In the following examples, list each element in the compound and the number of atoms of each element present. The first example has been done for you.

Name	Use	Formula	Atoms in Formula
Calcium carbonate	Limestone	CaCO_3	Ca = calcium 1 C = carbon 1 O = oxygen 3
Aspirin	Pain reliever	$\text{C}_9\text{H}_8\text{O}_4$	
Magnesium hydroxide	Found in milk of magnesia	$\text{Mg}(\text{OH})_2$	
Paradichlorobenzene	Moth crystals	$\text{C}_6\text{H}_4\text{Cl}_2$	
Acetic acid	Found in vinegar	$\text{C}_2\text{H}_4\text{O}_2$	
Trinitrotoluene (TNT)	Explosive	$\text{C}_7\text{H}_5(\text{NO}_2)_3$	
Calcium dihydrogen phosphate	Fertilizer	$\text{Ca}(\text{H}_2\text{PO}_4)_2$	

Name	Use	Formula	Atoms in Formula
Pyrite	Fool's gold	FeS ₂	
Sucrose	Sugar	C ₁₂ H ₂₂ O ₁₁	
Pentane	One of several components in gasoline	C ₅ H ₁₂	
Sulfuric acid	Used in car batteries	H ₂ SO ₄	
Cellulose	Found in wood products such as your pencil and paper	C ₆ H ₇ O ₂ (OH) ₃	
Asbestos	Insulator	H ₄ Mg ₃ Si ₂ O ₉	
Dichlorodiphenyl-trichloroethane (DDT)	Banned pesticide	C ₁₄ H ₉ Cl ₅	
Silicon dioxide	Sand	SiO ₂	
Iron oxide	Rust	Fe ₂ O ₃	
Butane	Lighter fluid	C ₄ H ₁₀	

Atomic Dimensions

The table below contains information about several elements. Use this table to review the concepts of atomic number, mass number, numbers of subatomic particles, isotopes, and charged and uncharged atoms. In each case, enough information has been provided for you to fill in all the blanks.

Element	Symbol	Atomic Number	Mass Number	Number of Protons	Number of Neutrons	Number of Electrons	Isotope, Ion, or Neutral Atom
Aluminum	Al		27	13		13	
Bromine		35	80		45	36	
Uranium	U	92			146	92	
Helium	He	2	4				
Helium	He	2	5			2	
Lithium		3	7			2	
Tungsten	W		184		110	74	
Xenon					79	54	Neutral atom
Magnesium	Mg		24				Positive 2 ion
Carbon		6			6		Neutral atom
Carbon	C		14	6	8		
Nitrogen		7	14				
Zinc	Zn	30	65				
Sodium		11				12	Neutral atom
Calcium			40			20	
Silver	Ag			47	61		